Letter and enclosure from Alexander Graham Bell to Mabel Hubbard Bell, from November 4, 1900, to November 29, 1900, with transcript

MEMORANDUM. Washington, D. C., Volta Bureau, November 29, 1900.

Mr. Bell asks me to make a copy of a paragraph which he wrote on the Steamer Ivernia, describing the principle involved in his method of producing fresh drinking water at sea without the use of fire.

B.A.S.

The following is the paragraph referred to: —

“Take two glass vessels filled with air; and let the air in one be damper than that in the other. Now, commencing with both vessels at the same temperature, let them gradually be cooled down together.

“Dew will begin to form inside the damper vessel before it shows within the other. The drier air must be cooled down more before moisture condenses; and when at last it does begin to appear as a fine mist, or dew, deposited upon the glass, the moisture in the damper vessel is condensing freely, and trickling down the sides of the vessel — as water.

“Thus drinking water can be produced from damp air by cooling it down to the dew point temperature of drier air”.

O.K. AGB

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Letter written by Alexander Graham Bell to Mabel (Hubbard) Bell. S. S. Ivernia, Sunday — November 4, 1900. Dear Mabel:

Where are you now I wonder — London — Paris — Brittany or Southern France. As for the Ivernia she is now in Lat. 48° 3# N Long. 42° 30# W — one day's sail from the Grand Banks. I have been having a grand think over all the great sea and especially the problem of drinking water from the sea without the use of fire, of undrinkable water upon which so many people die from thirst. “Water, water everywhere and not a drop to drink.” Theoretically there should be no difficulty in making drinking water from the ocean without fire — but practically — well — why do the people die? That problem has never been given a fair chance at solution in the laboratory — because other things always came first and absorbed the time. It really is worthy of serious consideration and I am now amusing myself by thinking it over.

The principle certainly is sound. Suppose you have two glass vessels containing air at the same temperature — the one containing damp air and the other air that is relatively dry.

Now let them both be gradually cooled down. The one containing damp air will begin to deposit moisture on the glass of its vessel before signs of deposition appear on the other. The dew-point temperature of the drier air — (that is the temperature at which it begins to deposit its moisture as dew is lower than the dew-point temperature of the damper air. If that proposition is true — and it is true — then it follows that you can condense drinking water from the ocean — without 2 fire — by cooling down a vessel containing damp air to the dew-point temperature of the atmosphere — by covering the vessel with a damp cloth and exposing it freely to the air or wind like the wet bulb of a dew-point thermometer. The dry air requires to be cooled down more before dew begins to show on the glass.

Take two glass vessels filled with air; and let the air in one be damper than that in the other. Now, commencing with both vessels at the same temperature, let them gradually be cooled down together.

Dew will begin to form inside the damper vessel before it shows within the other. The drier air must be cooled down more before moisture condensed, and when at last it does begin to appear as a fine mist, or dew, deposited upon the glass, the moisture in the damper vessel is condensing freely, and trickling down the aides of the vessel — as water.

Thus drinking water can be produced from damp air by cooling it down to the dew-point temperature of drier air.

The water of the ocean is undrinkable on account of the presence of dissolved salts. The drinkable water is then but mixed up with salts of various kinds. If you could only remove the salts you could drink from the ocean direct.

This is drinking water produced by cooling down the damper air to the dew-point temperature of the drier air.

Although we do not know how to remove the salt and leave the water behind — we can remove the water and leave the salt which amounts to the same thing. Evaporation will do it. The mere blowing of the 3 wind on a salt water pond will carry off the water little by little until only the encrusted salt remains.